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ABSTRACT

A study compared the professional knowledge competence of agricultural teachers with and without preservice teacher preparation in order to identify and describe selected characteristics of teachers of agricultural science in Peninsular Malaysia and to relate these characteristics to preservice teacher education. Data were collected through administration of a 50-item multiple-choice test on pedagogical knowledge constructed for the study and administered to 141 teachers who taught agricultural science at the upper-secondary level. About half had teacher preparation and half did not. The study found that the typical teacher was Malay, 31 years of age, male, had preservice teacher preparation, had 7 years of teaching experience in an academic school, had not completed inservice courses, and had moderate competence in professional knowledge. The study supported the hypothesis that teachers completing a preservice teacher preparation program have higher knowledge competence than those without preservice preparation. It is concluded that all teacher candidates should complete a preservice teacher preparation program before teaching agriculture and that testing should be done to assess teacher competence when selecting teachers. (KC)

Summary of Research

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Professional Knowledge CompetencyAchievement of Agricultural TeachersWith and Without Preservice Teacher Preparation in Peninsular Malaysia

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The domain of teacher competence which receives a great deal of attention from agricultural education researchers is the one pertaining to professional competencies. Professional competencies in teaching refer to the pedagogical knowledge and skills needed for the successful practice of teaching (Watts, 1982). Professional competencies also are regarded as those competencies which distinguish teachers from other professions (Moss, 1971).

How do teachers acquire professional competencies in teaching? The typical route by which a teacher acquires professional competencies is a standard, preservice teacher education program. This route is sometimes referred to as the professional route. As far as preservice teacher preparation is concerned, there has been a variation in programs within and between countries. The United States, for instance, has a long-standing four-year, baccalaureate-level program of teacher education. In other countries such as Malaysia, preservice teacher education is provided in various forms of programs, ranging from as short as one year in duration to as long as four years in duration. In spite of the variation of preservice teacher education programs, the emphasis is still the same, that is to provide adequate preparation in pedagogical knowledge and skills for prospective teachers prior to being admitted into the teaching profession.

Preservice teacher education programs are not the sole means by which a teacher gains entry into the teaching profession. In another approach, persons aspiring to become teachers are not required to possess preservice teacher qualifications. These persons are employed as teachers based on their possession of an academic qualification in a chosen teaching subject or on their occupational experiences. This approach is widely practiced in the United States and Malaysia (Haberman, 1986; Parramore, 1986; Tanner & Ebers, 1985; United Nations Educational, Social and Cultural Organization, 1971).

Given the circumstances that teachers are prepared differently, do they differ in professional competence? Previous studies (Bledsoe, Cox and Burnham, 1967; E. A. Moore, 1974; G. E. Moore, 1975; and Popham, 1978) compared the professional competence of teachers who underwent different certification programs. In every case, teachers with preservice teacher preparation were found to be more professionally competent than their counterparts who did not

have such preparation. Meanwhile, preservice teacher preparation has been shown to be one of the significant factors contributing to the high level of teacher competence in developing countries (Husen, Saha, & Noonan, 1978).

Purpose and Objectives

The purpose of the research was to compare the professional knowledge competence of agricultural teachers with and without preservice teacher preparation. The specific objectives were:

1. To identify and describe selected characteristics of teachers teaching agricultural science at the upper-secondary level of instruction in Peninsular Malaysia.
2. To compare the professional knowledge competence of agricultural teachers with the selected characteristics.
3. To compare agricultural teachers with and without preservice teacher preparation with the selected characteristics.
4. To compare the achievement of teachers with and without preservice teacher preparation in a professional knowledge competency test.

Methodology

Design

The research was designed to be an ex post facto type of research utilizing the static-group comparison design (Campbell & Stanley, 1963). In this design, type of teacher preparation, "with preservice teacher preparation" and "without preservice teacher preparation," was the naturally occurring event. The two types of teacher qualification were compared in terms of the professional knowledge competence as measured by achievement in a multiple-choice, professional knowledge competency test.

The following major hypothesis was set and tested: Teachers with preservice teacher preparation had significantly higher professional knowledge competence than those without such preparation. Following the advice of Kerlinger (1975), alternate or "control" hypotheses were set and tested using seven extraneous variables (race, age, gender, teaching experience, teaching location, teaching specialty area, and inservice courses completed).

Instrumentation

The dependent variable, professional knowledge competence, was measured by a 50-item, multiple-choice test developed by the researchers. The test covered seven areas of pedagogical knowledge based on literature review and existing teaching preparation programs. Prior to its administration, the test was reviewed for its content validity by selected teacher educators and education officers at The Ohio State University and in Malaysia. A field test was conducted on the instrument (using Malaysian subjects) and an item-analysis procedure was performed on the test. The test was reduced from 75 to 50 questions based on that analysis. The split-half reliability using the Kuder-Richardson formula was 0.67 with a standard error of measurement of 3.13. The test was administered in the Malaysian national language. The background variables of teachers were identified by means of a questionnaire.

Population

The target population was teachers who taught agricultural science at the upper-secondary level of instruction in April 1988. The teachers were identified by means of a current list provided by the

Ministry of Education and the Ministry of Agriculture, Malaysia. There were 143 teachers available for the study. However, only 141 teachers were accessible at the time of the study. Out of 141 teachers, 71 had preservice teacher preparation and 70 did not have such preparation.

Data Collection

Prior approval for conducting the research was obtained from the Ministry of Education and the Ministry of Agriculture, Malaysia. Upon the approval from both ministries, each teacher and the respective principal were notified about the upcoming research. The data were collected in the months of April and May, 1988. Throughout the data collection process, the researcher met the teachers personally. The answer sheet and the questionnaire were collected at the completion of each meeting.

Data Analysis

The dependent variable was measured in terms of percent of items correct. One point was given for each item correct and zero for each incorrect response. The independent variables were analyzed in terms of frequencies, percentages and means. The procedures used to compare the dependent variable with the independent variables were t-test and one-way analysis of variance. Both t-test and chi-square were used to compare teachers with and without preservice teacher preparation. The hypothesis testing was performed at the predetermined .05 level of significance.

Results

A typical teacher of agricultural science at the upper-secondary level of instruction could be described as: a Malay, 31 years of age, male, having preservice teacher preparation, having 7 years of teaching experience, teaching in an academic school, a noncompleter of inservice courses, and having moderate competence in professional knowledge.

Significant difference in professional knowledge achievement was found in relation to two extraneous variables: teaching location, and completion of inservice courses in the areas of educational sociology and classroom management (Table 1).

The major independent variable (type of teacher qualification) was found to have a significant relationship with four extraneous variables: race, teaching location, teaching specialty area, and completion of an inservice course in audiovisuals (Table 2).

Teaching location seemed to be the only extraneous variable which was found to be significant in both comparisons (professional knowledge and teacher qualification). An extraneous variable which appeared to be significant in both comparisons could pose a serious threat to the internal validity of the major hypothesis (Warmbrod & Miller, 1974). However, academic school teachers tended to be teachers who had preservice teacher preparation. This supports the finding with regard to the significantly higher achievement of teachers with preservice teacher preparation (Table 3).

Conclusions

The findings of the research clearly support the major hypothesis that teachers completing the preservice teacher preparation program possess higher knowledge competence than those without a preservice preparation. Thus, preservice teacher preparation could offer a plausible explanation for the high competence in the professional knowledge of teachers.

Teachers of different race, age, gender, teaching experience, teaching specialty

Table 1

Summary of Differences in Professional Knowledge Achievement Among Groups

Extraneous Variables	n	Mean Items Correct (%)	Test Statistic	Value
Race				
Malay	108	56.70	t	-1.48
NonMalay	33	60.00		
Age				
24-27	36	57.05		
28-31	41	58.19		
32-35	42	56.24	F	0.43
36-39	16	58.12		
40-48	6	62.00		
Gender				
Male	106	56.51	t	-1.79
Female	35	60.40		
Teaching Experience				
1-4 years	41	57.51		
5-8 years	52	58.11	F	0.42
9-12 years	31	55.61		
13-20 years	17	58.82		
Teaching Location				
Academic school	52	62.85		
Technical school	4	61.00	F	7.79*
Vocational school	30	54.67		
Agricultural institute	55	53.67		
Teaching Specialty Areas				
One ag-related subject	93	58.24		
Two ag-related subjects	23	55.91	F	0.81
Three ag-related subjects	18	54.55		
Combination of ag- and non-ag-related subjects	7	60.00		
Inservice Courses Completed				
Teaching Methods				
Completers	58	58.83	t	-1.20
Noncompleters	83	56.53		

table continues

Extraneous Variables	n	Mean Items Correct (%)	Test Statistic	Value
Audiovisuals				
Completers	49	56.53	t	0.73
Noncompleters	92	57.98		
Educational Philosophy				
Completers	38	58.79	t	-0.84
Noncompleters	103	56.99		
Educational Sociology				
Completers	21	63.05	t	-3.65*
Noncompleters	120	56.50		
Test and Evaluation				
Completers	33	60.48	t	-1.77
Noncompleters	108	56.55		
Principles of Teaching/Learning				
Completers	37	56.05	t	-0.36
Noncompleters	104	57.27		
Classroom Management				
Completers	19	62.74	t	-3.40*
Noncompleters	122	56.65		
Adolescent Development				
Completers	26	60.69	t	-1.62
Noncompleters	115	56.65		

*p<.05

Table 2
Summary of Differences in Type of Teacher Qualification Among Groups

	Qualification Type					
	With Preservice		Without Preservice		Test	
Extraneous Variables	n	%	n	%	Statistic	Value
Race						
Malay	45	63	63	90	chi sq.	12.49*
NonMalay	26	37	7	10		
Age	13	18	23	33		
28-31	23	32	18	26		
32-35	21	30	21	30	chi sq.	9.38
36-39	8	11	8	11		
40-48	6	9	-	-		

table continues

Extraneous Variables	Qualification Type: With Preservice n	With Preservice %	Without Preservice n	Without Preservice %	Test Statistic	Value
Gender						
Male	56	79	50	71	chi sq.	0.68
Female	15	21	20	29		
Teaching Experience	71	7.49[a]	70	7.10[a]	t	0.57
Teaching Location						
Academic school	48	68	4	6		
Technical school	4	5	-	-	chi sq.	98.36*
Vocational school	19	27	11	16		
Agricultural institute	-	-	55	78		
Teaching Specialty Areas						
One ag-related subject	62	87	31	44		
Two ag-related subjects	1	1	22	32	chi sq.	35.20*
Three ag-related subjects	4	6	14	20		
Combination of ag- and non-ag-related subjects	4	6	3	4		
Inservice Courses Completed						
Teaching Methods						
Completers	28	39	30	43	chi. sq.	0.06
Noncompleters	43	61	40	57		
Audiovisuals						
Completers	18	25	53	44	chi. sq.	4.77*
Noncompleters	53	75	39	56		
Educational Philosophy						
Completers	16	22	22	31	chi. sq.	1.00
Noncompleters	55	78	48	69		
Educational Sociology						
Completers	13	18	8	11	chi. sq.	0.83
Noncompleters	58	82	62	89		
Test and Evaluation						
Completers	18	25	15	21	chi. sq.	0.12
Noncompleters	53	75	55	79		
Principles of Training/Learning						
Completers	14	20	23	33	chi. sq.	2.50
Noncompleters	57	80	47	67		
Classroom Management						
Completers	11	15	8	11	chi. sq.	0.21
Noncompleters	60	85	62	89		
Adolescent Development						
Completers	14	20	12	17	chi. sq.	0.03
Noncompleters	57	80	58	83		

[a]Numbers in the column labeled "%" are mean number of years of teaching experience.
*$p < .05$.

Table 3
Professional Knowledge Achievement by Type of Teacher

Teacher Qualification	n	Mean[a]	SD	t
With preservice teacher preparation	71	60.79	10.79	3.68*
Without preservice teacher preparation	70	54.11	10.79	

[a]Mean percent of items correct.
*p<.05, one-tailed.

areas, and inservice courses completed (except in the areas of educational sociology and classroom management) were not significantly different in professional knowledge competence.

Teachers with preservice teacher preparation tended to be associated with the following characteristics: Non-Malays, teaching in academic schools, teaching a specialty area in one agriculture-related subject, and noncompleters of inservice courses in audiovisuals. Teachers without preservice teacher preparation tended to be associated with the following characteristics: Malays, teaching in agricultural institutes, teaching a specialty area in one or more agriculture-related subjects, and completers of an inservice course in audiovisuals.

Recommendations

All teacher candidates should complete a preservice teacher preparation program before they are considered for a teaching job in agriculture.

Testing is recommended as a means of assessing teacher competence for the purpose of screening and selecting teachers of agriculture. It is further recommended that the test results be correlated with the results of other assessment strategies such as observation and ratings by peers, school principals, supervisors, and students.

Considering the fact that the present research is exploratory in nature, further research is needed for identifying and testing the relationship of other independent variables, particularly the teacher's socioeconomic background, martial status, academic achievement, grade level taught, region, and setting (formal and nonformal) with professional knowledge achievement.

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SUMMARY OF RESEARCH SERIES

Agricultural educators continue to be interested in comparing the pedagogical knowledge and skill of those teachers who enter the teaching profession through standard, preservice teacher education programs and those who enter the profession based on their possession of an academic qualification in a chosen teaching subject or on their occupational experience. The practice of entering the profession through the occupational experience route is popular throughout the world, even though teachers with preservice teacher preparation have been found to be more professionally competent than their counterparts who did not have such preparation. This study reports research conducted in Malaysia which compared the professional knowledge competence of agriculture teachers with and without preservice teacher preparation.

This summary is based on a dissertation by Mohd. Ibrahim Nazri under the direction of R. Kirby Barrick. Mohd. Ibrahim Nazri was a graduate student in the Department of Agricultural Education at The Ohio State University. He is currently working on the Faculty of Educational Studies in the Department of Education at the Universiti of Pertanian, Malaysia. Dr. R. Kirby Barrick is Professor and Acting Chair, Department of Agricultural Education, The Ohio State University. Special appreciation is due to Julia Gamon, Iowa State University; Jimmy G. Cheek, University of Florida; and Rosemarie Rossetti, The Ohio State University for their critical review of the manuscript prior to publication.

Research has been an important function of the Department of Agricultural Education since it was established in 1917. Research conducted by the Department has been generally in the form of graduate theses, staff studies, and funded research. It is the purpose of this series to make useful knowledge from such research available to practitioners in the profession. Individuals desiring additional information on this topic should examine the references cited.

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